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Study of the susceptibility of *Sechium edule* to fruit flies (Diptera: *Tephritidae*) in laboratory conditions

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Background. *Sechium edule* (chayote) is a cucurbit largely cultivated under arbour in Reunion Island but its production strongly declined in recent years. Farmers attributed the yield losses to fruit flies (Tephritidae, Dacini) (*Bactrocera cucurbitae*, *Dacus ciliatus* and *Dacus demmerezi*). However, observations of chayote fruits taken on arbour and on the ground showed limited damage due to Cucurbit flies. The aim of this study was to assess the susceptibility of *S. edule* to four fruit flies species (*B .cucurbitae, D .ciliatus, D .demmerezi, and C .rosa*), particularly in studying (i) the growth of eggs laid naturally in fruit by gravid females, and (ii) the growth of larvae artificially deposited in fruit.

Methods. Two types of experiments were conducted in 2009 and three types of fruit were compared: *S. edule* (young fruit <10cm and mature fruit >10cm) and *C. pepo* as a control. In the first trial, for each species of flies, fruit (*S. edule* and *C. pepo*) were individually exposed to cohorts including gravid females and the number of pupae obtained and adult flies emerged from each fruit were then counted after two weeks. In a second trial, pieces of fruit were artificially infested by L1 larvae of the four species, and their survival rate was measured during six days.

Results. Growth of the four species of flies was better in *C. pepo* than in *S. edule*, especially for *B. cucurbitae* (615 pupae in *C. pepo* versus 0 pupae in *S. edule*) *and D. demmerezi* (445 versus 250 pupae). The mean number of *B. cucurbitae* pupae released from each fruit of *C. pepo* were no significantly different ($p>0.05$) to *D. demmerezi*. Complete development (eggs to emerged flies) on *S. edule* was observed only for *D. demmerezi* and *D. ciliatus*. Nevertheless, *D. demmerezi* had a better development on *S. edule* than *D. ciliatus*, besides its growth was superior in young fruit.

Conclusions. These results lead us to learn more about the development of fruit flies in *S. edule*. The low levels of infestation observed and the difficulties of development for the larvae allowed us to suggest that fruit flies might not be the only cause of damage and yield losses in chayote crop. These results are essential to provide guidelines and to adapt the fruit flies management scheme to the particular case of *S. edule* crop.

Key words: *Sechium edule*, fruit flies, larval development, emergence rate, Reunion Island